IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Kim

Application No.: 09/734,278

Filed: 12/10/2000

For: UNIVERSAL THREE-DIMENSIONAL GRAPHICS VIEWER FOR RESOURCE CONSTRAINED MOBILE COMPUTERS

Examiner: ANYASO, UCHENDU O

Technology Center/Art Unit: 2675

AMENDMENT AND RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sirs:

The Office Action mailed 7/16/2002 rejected claims 1, 3-8, 13, 14, 19 and 20 under 35 U.S.C. 102(b) as being anticipated by B. Schneider et al. (Printed Publication: "An Adaptive Framework for 3D Graphics in Networked and Mobile Environments", Proc. Workshop on Interactive Applications of Mobile Computing, IMC'98, Nov. 1998). Further, claims 2, 9-12, 15-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over B. Schneider et al. (Printed Publication: "An Adaptive Framework for 3D Graphics in Networked and Mobile Environments", Proc. Workshop on Interactive Applications of Mobile Computing, IMC '98, Nov. 1998) in view of Deering (U.S. Patent 5,793,371). Applicant respectfully traverses the rejection as follows.

The Section 102 Rejection

Claims 1, 3-8, 13, 14, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by B. Schneider et al. (Printed Publication: "An Adaptive Framework for 3D Graphics in Networked and Mobile Environments", Proc. Workshop on Interactive Applications of Mobile Computing, IMC'98, Nov. 1998). The Office Action noted as follows:

> Regarding independent claims 1, 8 and 13, and for claims 3-7, 14, 19, 20, Schneider teaches an adaptive framework for 3D graphics in networked and mobile environments wherein a network graphics framework (NGF) integrates various transmission methods for downloading 3D models in a client-server environment (see Abstract).
>
> Furthermore, Schneider teaches a software architecture wherein a server is implemented within the NGF framework and is responsible for evaluating the parameters of each method in response to a client request, and for converting between raw data and the formats required by different transmission methods (page 4, column 2, lines 7-13).
>
> Furthermore, Schneider teaches the results of implementing NGF with several models wherein a model (figure 2) was downloaded from a server to clients with different rendering capabilities (page 5, column 2, lines 10-13). Herein, a handheld in the form of a Thinkpad mobile computer is adapted to communicate with the server, and the Thinkpad is capable of visualizing the 3D model (page 5, column 2, lines 10-34; page 6, paragraph 2).

Applicant respectfully traverses the rejection. Schneider notes that "[a]ccess to and transmission of 3D models over networks becomes increasingly popular. However, the performance and quality of access to remote 3D models strongly depends on system load conditions and the capabilities of the various system components, such as clients, servers, and interconnect. The network graphics framework (NGF) integrates various transmission methods for downloading 3D models in a client-server environment. The NGF automatically selects the optimal transmission method for a given pair of client and server, taking into account characteristics of the model to be transmitted, critical

environment conditions, user preferences and the capabilities of the client and the server. The NGF aims to provide constant quality of service across different clients and under varying environment conditions." (Abstract).

Schneider goes on to state on page 4, column 2 that "NGF implements an object-oriented client-server paradigm. The server is responsible for storing model databases, for evaluating the parameters of each method in response to a client request, and for converting between the raw data and the formats required by different transmission methods. The evaluation of the method parameters includes computing the quality of the FMM and the entire scene based on user preferences, measuring the available network bandwidth, and estimating conversion and rendering times taking into account the server load, the hardware configuration of the client, and the display window size."

Even though Schneider's column 2 mentions the conversion of raw data and formats required by different transmission methods, Schneider's conversion when read in its entirety relates to network transmission methods. In contrast, claim 1 recites a server to receive a 3D file, the 3D file conforming to one or more formats; and a handheld device adapted to communicate with the server the 3D file, the handheld device capable of visualizing the 3D file.

The format in claim 1 and in each independent claim relates to 3D graphics format, not transmission format. The file format handling is further described in Fig. 7A and on pages 17-18 of the Applicant's specification as follows:

> Fig. 7A shows an embodiment for processing 3D graphics files on the handheld device 104, while Figs. 7B-7E shows various embodiments of a graphics viewer that supports multiple file formats. In Fig. 7A, the graphics file can go directly to the universal viewers for viewing, or can go through intermediate conversion into a universal file format. The system of Fig. 7A

allows the user to have only one viewer installed on his/her handheld device and view graphics files with different formats.

The universal viewer may employ one or more of the following exemplary methods. As shown in the embodiment of Fig. 7B, one way is to translate various file formats to one 'universal' file format before sending the file to the wireless device to display it. The conversion will be done on a server or other external computing devices before the file is loaded on to the device. As shown in Fig. 7C, a second way is to have different types of 3D files sent to the wireless device, and have the software in the device translate the differing file formats to one type of file format before displaying it on the device. Fig. 7D shows a third way, which is to have a viewer that is really a collection of different types of viewers where each of them recognize one of the many 3D file formats to be recognized. Even though this approach is a collection of different viewers, it is still beneficial because of the fact that it shares a common graphics renderer (which is still a good code size saving). As shown in Fig. 7E, the fourth way is to have a viewer built with common modules that decode multiple formats. This method takes advantages of the fact that even though all proprietary files have different formats, they often have similar structures. For example, a typical graphics file would have any combination of the following four components: polygon structure information, texture information, lighting information, and animation instructions. For each of the components, different file formats would have different sub-structures. In a grossly simplified example, one file may have polygon structure information read 2 bytes at a time, and another would have it read 4 bytes at a time. The universal viewer's polygon structure decoding module would know how many bytes to be read for each of the file formats it supports, and would read them correctly – using one common program, with a unique 'switch' value that corresponds to each of the file formats.

A Section 102 rejection requires each and every element be present in Schneider. As shown above, the formats in the claim relate to graphics formats, while the Schneider formats relates to wireless format. The two are completely different.

Since Schneider fails to show the one or more formats recited in each independent claim, Schneider cannot anticipate the independent claims as well as claims that depend therefrom. Withdrawal of the Section 102 rejection on claims 1, 3-8, 13, 14, 19 and 20 is requested.

The Section 103 Rejection

Claims 2, 9-12, 15-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over B. Schneider et al. (Printed Publication: "An Adaptive Framework for 3D Graphics in Networked and Mobile Environments", Proc. Workshop on Interactive Applications of Mobile Computing, IMC '98, Nov. 1998) in view of Deering (U.S. Patent 5,793,371). The Office Action noted that:

> Regarding claims 2 and 9-12, in further discussion of claims 1 and 8, Schneider does not teach a server performing file compression. On the other hand, Deering teaches a method and apparatus for geometric compression of 3D graphics data wherein server 20 includes a 3D graphic compression unit 60 (column 5, lines 35-43, figure 1 at 20, 60).
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> Thus, it would have been obvious to a person skilled in the art to combine Schneider and Deering's teaching because while Schneider teaches an adaptive framework for 3D graphics in networked and mobile environments wherein a network graphics framework (NGF) integrates various transmission methods for downloading 3D models in a client-server environment (see Abstract), Deering teaches a server 20 that includes a 3D graphic compression unit 60 (column 5, lines 35-43, figure 1 at 20, 60). The motivation for combining these teachings would have been to increase the amount of geometry that can be cached or stored in the fast main memory of a computer system (column 1, lines 48-53).
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> Regarding claims 15-18, in further discussion of claim 13, Schneider does not teach code to perform resolution skipping operations on objects. On the other hand, Deering teaches how to perform a skip 8 instruction code which affects the manner in which the object is perceived (column 24, lines 41-67, figure 15J).
>
> Thus, it would have been obvious to combine Schneider and Deering's inventions because while Schneider teaches an adaptive framework for 3D graphics in networked and mobile environments wherein a network graphics framework (NGF) integrates various transmission methods for downloading 3D models in a client-server environment (see Abstract), Deering teaches how to perform a skip 8 instruction code which affects the manner in which the object is perceived (column 24, lines 41-67, figure 15J). The motivation for combining these inventions would have been to provide an efficient morphing capability in the 3D system so as to eliminate any abrupt perception gap in viewing a decompressed three-dimensional object (column 24, lines 59-61, figure 15J).

Applicant respectfully traverses the rejection. Deering describes a compression system where three-dimensional geometry is first represented as a generalized triangle

mesh and a data structure that allows each instance of a vertex in a linear stream to specify an average of two triangles. Individual positions, colors, and normals are quantized, preferably quantizing normals using a novel translation to non-rectilinear representation. A variable length compression is applied to individual positions, colors, and normals. The quantized values are then delta-compression encoded between neighbors, followed by a modified Huffman compression for positions and colors. A table-based approach is used for normals. Decompression reverses this process. The decompressed stream of triangle data may then be passed to a traditional rendering pipeline, where it is processed in full floating point accuracy.

Neither Schneider nor Deering, singly or in combination, shows the independent claims' server to receive a 3D file, the 3D file conforming to one or more formats; and a handheld device adapted to communicate with the server the 3D file, the handheld device capable of visualizing the 3D file. Hence, the combination fails as one or more elements are not present in Schneider or Deering. Further, the combination is non-functional. As shown above, the formats in the claim relate to graphics formats, while the Schneider formats relates to wireless format and Deering relates to 3D geometry for CAD and large scale computers. The two are completely different and combining the two would not result in a functional system. Moreover, Deering addresses issues faced by MCAD and other large graphics system and does not handle issues associated with handheld or mobile devices. Further, there is no suggestion to modify Schneider with the teachings of Deering to arrive at the claimed invention as Schneider and Deering are in completely different technologies of wireless transmission format and CAD type compression.

Since Schneider fails to show the one or more formats recited in each independent claim, Schneider cannot render the independent claims as well as claims that depend therefrom. Similarly, Deering in combination with Schneider cannot render the claims obvious.

For the foregoing reasons, one skilled in the art would not combine Schneider and Deering to arrive at the claimed inventions. Applicant submits that all claims in condition for allowance.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 408-528-7490.

Respectfully submitted,

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